Notes on a collection of birds from south Borneo

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The exploration of the bird life of Borneo was considered more or less completed around the turn of the century. Our point of view on species and subspecies has, however, been completely revolutionized since that date and it has become necessary to rework the avifauna of the various islands of Malaysia. An exploration of northern Borneo undertaken in 1927 by Chasen and Kloss yielded unexpectedly rich results. They were not only able to describe 19 new forms, but their researches also indicated greater differences between the avifauna of the various parts of Borneo than had hitherto been apparent. It seemed desirable in the light of this recently gained knowledge to undertake a similar exploration of south Borneo.

Mr. J. J. Menden of Cheribon, Java, collected for the American Museum of Natural History, New York, in 1935 in two different districts of south Borneo. In June and July collections were made at Parit, which is at the Tjempaga (Chamaga) River, about 20 miles above its junction with the Sampit River. A second collection was made in November and December a little further west at Riam, at the Kota Waringin River. The two collections, which came to us through Prof. Neumann (Berlin), contained 648 specimens of 157 forms. A study of this collection was combined with a revision of several particularly interesting species with the help of the material of the Rothschild Collection. This resulted in the discovery of seven undescribed forms.

Dr. Herbert Friedmann, U.S. Nat. Museum, sent me very kindly for comparison a large amount of material, principally from east Borneo, and the curators of the museums in Chicago, Cambridge, and Philadelphia also assisted me with the loan of material. I am deeply obliged to all of them. The greatest help during the working out of this collection was the admirable paper by Chasen and Kloss on the birds of north Borneo (Bull. Raffles Museum, No. 4 (1930)).

The Menden collection was made entirely in the lowlands, and apparently does not contain a complete representation of the bird-fauna of south Borneo, since it was gathered by a professional collector and not by an ornithologist. It would therefore, be dangerous to base too many conclusions on the contents of this collection. Certain parts of Borneo are still rather inadequately known, and the time has not yet come for a final treatment of the distribution and geographical variation of the Borneo birds. It is, however, possible to point out interesting differences between the bird life of south and north Borneo (*see* also Treubia, XIV, p. 11).

I want to list first the species of the Menden south Borneo collection, which were not obtained by Chasen and Kloss in north Borneo (1927). The majority of these species have been collected in north Borneo by earlier collectors, but their absence in the Chasen and Kloss collection has probably some zoogeographical significance. Some of these species are undoubtedly missing in north Borneo.

Butorides striatus, Dupetor flavicollis, Dissoura stormi, Aviceda jerdoni, Haliastur indus, Accipiter trivirgatus, Spizaëtus cirrhatus, Spizaëtus nipalensis, Ichthyophaga nana, Spilornis cheela, Microhierax caerulescens, Rhizothera longirostris, Cuculus micropterus, Hierococcyx fugax, Carpococcyx radiatus, Bubo ketupu, Otus bakkamaena, Lyncornis temminckii, Caprimulgus concretus, Ceyx rufidorsus, Chotorhea rafflesii, Cranorhinus corrugatus, Rhinoplax vigil, Anthracoceros coronatus, Anthracoceros malayanus, Anorrhinus galeritus, Dryobates hardwickii, Mülleripicus pulverulentus, Corydon sumatranus, Pitta granatina, Chloropsis cochinchinensis, Microtarsus melanoleucus, Kittacincla malabarica, Drymophila velata, Pityriasis gymnocephala, Corvus enca, Dicaeum chrysorrheum, Dicaeum concolor, Anaimos percussus, and *Lonchura leucogastra.*

Still more interesting are the cases where two distinct subspecies occur in north and south Borneo. It is yet impossible to work out the exact ranges of these representative forms, and the following table is merely intended to indicate the geographical variation of some of the species represented in the Menden collection.

	North	South
Spilornis cheela	*pallidus**	*richmondi*
Excalfactoria chinensis	*lineata*	*palmeri*
Lophura ignita	*nobilis**	*ignita*
Treron fulvicollis	*baramensis**	*fulvicollis*
Treron vernans	*griseicapilla*	*purpurea*
Rhinortha chlorophaea	*fuscigularis*	subspecies
Bubo ketupu	"*pageli*"	*ketupu*
Strix leptogrammica	*vaga**	*leptogrammica*
Callolophus miniaceus	*malaccensis*	*dayak*
Chrysophlegma mentale	*saba* (northeast)	*humii** (west)
Meiglyptes tukki	*tukki*	*percnerpes*

	North	South
Corydon sumatranus	*orientalis* (east)	*brunnescens* (west)
Pitta granatina) *venusta*)	*venusta*	*granatina*
Aegithina tiphia	*aequanimis**	*viridis*
Alophoixus phaeocephalus	*connectens*	*diardi*
Copsychus saularis	*niger**	*pluto* and *problematicus*
Pellorneum capistratum	*morrelli*	*capistratoides*
Malacopteron magnum	*saba**	*magnum*
Cyanoderma erythroptera	*bicolor*	*rufa*
Mixornis gularis	*montanus*	*bornensis*
Cyornis turcosa	*rupatensis* (west)	*turcosa* (east)
Oriolus xanthonotus	*consobrinus*	*xanthonotus*
Anthreptes malaccensis	*bornensis**	*malaccensis*
Dicaeum cruentatum	*nigrimentum*	subspecies?
Lonchura leucogastra	*leucogastra?*	*castanonota*

I have marked with an asterisk those races which are larger. In eight out of nine cases in which I had sufficient material, the north Borneo race proves to be larger than its south Borneo representative.

In addition to the species which break up on Borneo into definite races, we have a great many others which show slight differences, not worthy of a name. I have called attention to this variation in the detailed discussion of each species, but I want to emphasize here, that it is practically always a size variation. It can be stated as a general rule that in a great many species the north Borneo population shows larger measurements than the south Borneo birds. I have tried to correlate this with the climate, but the available meteorological data are not sufficient to prove such a correlation. There is, however, little doubt in my mind that the great mountain ranges of northwest Borneo cause a sufficient lowering of the general temperature to account for the increase of size. Furthermore, there is comparatively little lowland in north Borneo and the larger birds of the higher altitudinal levels (vertical variation!) raise the average of the lowland birds by mixing with them. I have found only few exceptions to this rule, but curiously enough, most of them are woodpeckers.

The following is the list of the species, which show smaller measurements in south Borneo than have been recorded by Chasen and Kloss for their north Borneo birds:

Meiglyptes tristis micropterus
Rhipidura javanica longicauda
Rhinomyias u. umbratilis
Chloropsis sonnerati zosterops

Ixos malaccensis
Pycnonotus erythrophthalmus salvadorii
Orthotomus sepium borneoensis
Dicaeum trigonostigma dayakanum
Aethopyga siparaja siparaja
Cinnyris brasiliana
Arachnothera longirostra büttikoferi

and the eight subspecies, listed above (p. 6, 7).

The following four forms, three of which are woodpeckers, seem to be larger in south Borneo than in north Borneo:

Chrysophlegma mentale saba
Chloropicoides rafflesii borneoensis
Dryocopus javensis javensis
Dissemurus paradiseus brachyphorus

The following is a complete list of all the collected specimens. Only those species, however, were discussed in detail in which the study of the collection shed some new light on the taxonomic problems of Malaysia. All measurements are in millimeters. The wing (= w.) was measured the European way, with a rule, the tail (= t.) with a divider.

Concluded June 30, 1937.

Rhizothera longirostris longirostris (Temminck).

1 ♂ ad., Riam; wing, 198; tail 85.

Excalfactoria chinensis palmeri Riley

4 ♂, 3 ♀, Parit; wing, ♂ 72, 73, 73, 75, ♀ 75, 75, 76.

The four Parit birds agree reasonably well with a series of five Java males (including the type). They show as much or more blue gray as they, but the black pattern of the upper parts is coarser on a less brownish ground color. They differ in this respect about the same way as *lineata* differs from *chinensis*. The rufous brown of breast and belly is separated in the Borneo bird from the throat by a narrow or broad zone of blue gray, while this zone is narrow or absent in Java birds. The south Borneo females are slightly darker than Java birds on the upper parts as well as particularly on breast and flanks.

Birds from north Borneo lack the bluish on the upper parts, they are distinctly streaked and with strongly developed black markings. Hachisuka (1926, Bull. Brit. Orn. Club, XLVII, p. 69) has described a race *caerulescens* from Sarawak, of which I have seen no specimens. It is considered a synonym of *lineata* by Chasen (Malaysian Birds, p. 5).

Rollulus roulroul (Scopoli)

5 ♂ ad., 1 ♀ subad., Parit; wing, ♂ 135, 137, 138, 140, 145; ♀ 136.

Lophura ignita ignita (Shaw and Nodder)

2 ♂ ad., 6 ♂ subad., 8 ♀ ad., Riam; wing, ♂ ad., 272, 280; ♂ subad., 262, 267, 267, 267, 267, 271; ♀ ad., 234, 239, 242, 247, 247, 247, 248, 249, 254; tail, ♂ ad. (207 + x), 257; ♂ subad., 192, 192, 194, 197, 198, 200; ♀ ad., 156, 156, 158, 162, 170, 175, 177, 177.

There are apparently no color differences between birds from south Borneo, Sarawak, and north Borneo; in my material specimens from north Borneo usually have the blue-black parts more purplish blue and south Borneo more steel blue, but this may be due to post-mortem changes. There is, however, a decided difference of size, birds from Sarawak and north Borneo being very much larger:

Wing, ♂ ad., 280, 282, 285, 288, 288, 292, 293; ♀ ad., 252, 253, 254, 260, 260, 263, 264, 270.

Tail, ♂ ad., 254, 254, 262, 272, 285; ♀ ad., 180, 181, 184, 186, 186, 188.

The type of *ignita* is apparently no longer existing, but it came probably from that section of Borneo, which was most easily accessible from Singapore and Java, at the time Shaw and Nodder described the species (1797), namely south Borneo between Pontianak and Bandjermasin. I therefore, restrict the type-locality of *Phasianus ignitus* Shaw and Nodder to south Borneo. *Gallus macartneyi* Temminck, which was based on a caged bird from Batavia, Java, also refers to this race. The larger, northern bird must be named *Lophura ignita nobilis* Sclater (1863, Proc., Zool. Soc. London, p. 119.—"Borneo"). The original description of *nobilis* was primarily or exclusively based on two adult Sarawak males sent to the British Museum by Rajah Brook, as Mr. Kinnear kindly informs me. I therefore, restrict the type locality of *nobilis* to Sarawak.

Argusianus argus grayi (Elliot).

1 ♂ ad., 2 ♀ ad., Riam; wing, 2 ♀, 303, 326.

There is no difference in size between north and south Borneo birds, but the male from south Borneo has the brown vermiculation of back and mantle much reduced and replaced by black. The two females are darker, duller and more mottled with blackish than two females from north Borneo. The rufous of the throat and nuchal collar is deeper, more brownish, not as orange as in the north Borneo birds. These differences appear to be insignificant.

Treron curvirostra nasica Schlegel

2 ♂ ad., 1 ♀ ad., Riam; wing, ♂ 131, 133; ♀ 127.

These three specimens differ markedly from a series of specimens from the Malay Peninsula (typical *curvirostra*) and indicate that *nasica* is a valid race.

The adult males of *nasica* have the mantle darker, more grayish, less reddish-maroon; the upper tail-coverts and the tail are more greenish, less citrine; the under parts are purer and darker green, more mixed with gray on the flanks and on the middle of the belly and with the yellowish pink wash of the breast almost absent. The female is similar to those of *curvirostra*, but more greenish, less citrine throughout, particularly on the tail.

Treron fulvicollis fulvicollis (Wagler)

2 ♂ ad., 1 ♀ ad., Riam; wing, ♂ 142, 150, ♀ 144; tail, ♂ 85, 86, ♀ 86.

The two south Borneo males have abdomen and lower back very grayish, while in two males from Mergui these parts are prevailingly greenish. Of two males from Bunguran (wing 147, 157) one is very gray, the other more greenish. I consider *oberholseri* a very weak race; the overlap of measurements is quite considerable and there are no other differences.

Treron vernans purpurea (Gmelin)

4 ♂ ad., 1 ♂ imm., 1 ♀ ad., Parit; wing, ♂ ad., 143, 148, 150; ♀ 137.

These specimens are somewhat intermediate between the dark *griseocapilla* and the pale *purpurea*, but nearer to the latter; they have not very much gray below the vinaceous nuchal collar; the forehead is pure gray in two specimens, and washed with greenish in the two others; the subterminal black bar on the tail is rather wider than in specimens of *purpurea*.

The wing in typical *purpurea* varies between 142 and 149 mm. There is approximately the same range of variation on Java and the Lesser Sunda Islands, one south Borneo bird measures 150 m. Very much larger is the population which occurs on Kangean, in the Java Sea, as has been pointed out by several authors (*see* Hartert, 1902, Novit. Zool., IX, p. 422). I measure for two Kangean specimens: ♂ 161, ♀ 160, Hartert for the same birds ♂ 162, ♀ 158. Vordermann even measured 167 for the wing of a male. Although there are only three specimens available, the smallest of them is by full 10 mm. larger than the largest *purpurea*. There is no doubt that the Kangean Island form deserves to be named.

Treron vernans kangeana, new subspecies

Type.—No. 548503, Amer. Mus. Nat. Hist. (Rothschild Collection); ♂ ad., E. Kangean Island; August, 1901; E. Prillwitz.

Similar to *purpurea*, but larger; wing 160–167, against 142–150; adult male very pale and gray throughout; female paler and purer green above than series of *purpurea*.

Treron olax (Temminck)

1 ♂ ad., 1 ♀ ad., Parit; 2 ♂ ad., Riam; wing, 3 ♂, 119, 122·5, 127; ♀ 120.

The males of this species have a remarkable development of glossy, silky, hairlike feathers, particularly on the throat.

Butreron capellei magnirostris (Strickland)

1 ♂ ad., 1 ♂ juv., 2 ♀ ad., Riam; wing, ♂ 196, 183 (juv.), ♀ 196, 202.

Ducula ænea ænea (L.)

6 ♂ ad., 1 ♂ juv., 2 ♀ ad., Parit; wing, ♂ 234, 235, 237, 241, 241; ♀ 230, 234.

Compared with a series of *sylvatica* from upper Burma, these birds are more metallic above (not so dull), paler gray below, the gray nuchal collar is more pronounced, the bill shorter and the upper throat is whiter; compared with birds from the Lesser Sunda Islands, there is more white on the forehead and there is always a conspicuous ring of white feathers around the eye, which is usually missing in birds from the Lesser Sunda Islands.

Chalcophaps indica indica (L.)

1 ♀, Parit; 1 ♂ juv., Riam; both birds molting the wing.

Amaurornis phœnicurus javanicus (Horsfield)

1 ♀ ad., Parit; wing 138, tail 52, tarsus 51.

Dissöura stormi (Blasius)

1 ♂, 1 ♀, Parit; wing, ♂ 398, ♀ 404; tail, ♂ 136, ♀ 143.

Butorides striatus subsp.

1 ♂ imm., 1 ♀ ad., Riam; wing, ♂ 180, ♀ 189.

These measurements are too large for *javanensis* (*see* 1936, Temminckia, I, pp. 23–24) and agree better with those of *connectens*. The fact that the female is very worn and has not yet molted on November 18, and that the immature has still partly a downy plumage, indicates them as resident individuals. Chasen and Kloss measure 177 (♂) and 170 (♀) for two birds from Pontianak (Treubia, XIV, p. 12).

Bubulcus ibis coromandus (Boddært)

1 ♀, Riam; wing 239, tail 80, culmen 60.

Dupetor flavicollis flavicollis (Latham)

1 ♀ imm., Riam; wing 196.

Accipiter trivirgatus trivirgatus (Temminck)

2 ♀ ad., 1 ♀ imm., Riam; ♀ ad., wing 216, 218; tail 158, 164; tarsus 62, 63.

Spizaëtus cirrhatus limnæetus (Horsfield)

1 ♀ imm., Riam; wing 392, tail 250.

Spizaëtus nipalensis alboniger (Blyth)

1 ♂ subad., 2 ♀ subad., Riam; wing, ♂ —, ♀ 310, 325; tail, ♂ 218, ♀ 219, 234.

Spilornis cheela richmondi Swann

3 ♂ ad., Riam; wing, ♂ 324, 332, 338; tail, 200, 201, 203; tarsus, 75, 78, 82. An ad. female from Kuala Kapuas (Martin coll.) measures: wing 360, tail 230, tarsus (76).

This race is much smaller than *pallidus* from Sarawak and north Borneo (wing, ♂ 356, 358, ♀ 392; tail, ♂ 220, 228, ♀ 252). The additional characters given by Kirke Swann do not seem to hold. Our specimens from south Borneo (only fresh feathers compared) are lighter, not darker than such of *pallidus*. The tail-band varies from 39–52 mm. in *richmondi* and 39–55 in *pallidus*, averaging in the smaller *richmondi* somewhat smaller (in proportion with the smaller tail). Neither have I found any difference in the width of the white bars.

Icthyophaga nana nana (Blyth)

1 ♂ ad., Riam; wing 344, tail 174.

Haliastur indus intermedius Gurney

1 ♂ ad., Parit; wing 392.

Aviceda jerdoni borneensis (Sharpe)

1 ♂, 1 ♀, Parit; wing, ♂ 294 + x, ♀ 317, tail, ♂ 196, ♀ 195.

Microhierax cærulescens fringillarius (Drapiez)

4 ♂ ad., 1 ♂ imm., 4 ♀ ad., 1 ♀ imm., Riam; wing, ♂ ad. 92–97 (95·4), ♀ ad. 99–106 (101·6), tail, ♂ ad. 50–54 (52·6), ♀ ad. 55–58 (56·5).

Bubo ketupu ketupu (Horsfield)

2 ♂ ad., Riam; wing 326, 327, tail 153, 158.

Borneo birds are small, as are Sumatra birds; Java and Burma birds are larger. Measurements for birds from various localities are as follows:

Bali, ♂, wing 360, tail 173.

Java, wing, ♂ 341, 347, 350, 357, ♀ 362; tail, ♂ 157, 166, 169, ♀ 170.

North Borneo, ♂, wing, 312, 334, 343; tail, 153, 154, 162.

Sumatra, wing, ♂ 320, 349, ♀ 335, 338; tail, ♂ 158, 165, 170, ♀ 158.

Malay Peninsula, wing, ♂ 341, 342, 347, ♀ 320, 330; tail, ♂ 167, 168, 171, ♀ 162, 166.

Burma, wing, ♂ 353, ♀ 365; tail, ♂ 174, ♀ 172.

Assam, ♂, wing 367, tail 187.

Some of the sexing may not be correct.

In his laconic description of *B. k. pageli* (1935, Bull. Brit. Orn. Club, LV, p. 138) Neumann indicates as the only character the deeper coloration of the Borneo bird; "far more reddish or brick red [sic!] than typical *ketupu* from Java".

I have spread out on a long table a series of 27 specimens of this species arranged according to the hue of the coloration of the under parts without consulting the labels for localities. This sequence was checked by other members of the department. This sequence of the specimens, starting with the palest and ending with the most deeply rufous colored bird is as follows:

(S = Sumatra, J = Java, B = Bali, SB = South Borneo, NB = North Borneo, M = Malay Peninsula, Bu = Burma, A = Assam).

S (pale extreme), Bu, Bu, S, A, M, S, J, M, J, Bu, S, SB, SB, M, J, M, M, NB, NB, S, NB, M, J, Ba, NB, J, (most rufous extreme).

This series indicates clearly that, although birds from north Borneo average more deeply rufous, and such from Assam and Burma paler, more clay colored, than typical Java birds, there is a great deal of overlap. The darkest of all the specimens is a Java bird. The average paleness or rufousness of the various populations can be expressed numerically, if we give each bird its place number, calling the palest bird 1 and the most rufous 27.

Burma + Assam = 2, 3, 5, 11, av. = 5·2; Sumatra = 1, 4, 7, 12, 21, av. = 9·0; Malay Peninsula = 6, 9, 15, 17, 18, 23, av. = 14·7; Java = 8, 10, 16, 24, 27, av. = 17·0; Borneo = 13, 14, 19, 20, 22, 26, av. = 19·0; North Borneo (only) = 19, 20, 22, 26, av. = 21·8; Bali, 25.

It seems very doubtful, whether *pageli* can be accepted as a valid race.

Otus bakkamœna lempiji (Horsfield)

1 ♀, Parit; wing 141, tail 65.

Belongs to the rufous phase and agrees quite well with a north Borneo bird in the same phase, one other north Borneo bird is intermediate, and four are in the gray phase.

There is considerable individual variation in this species, but there is little doubt that several different populations are now combined under the name *lempiji*. A revision is impossible without much more material than I have now at my disposition, but the populations in Malaysia seem to vary as follows: *Borneo* birds are rather dark on the upper parts, with the blackish spots much pronounced, and with a rufous brown wash; the under parts average rather grayish (even in the rufous type) and are heavily marked (streaks and vermiculation). Birds from the *Malay Peninsula* average rather light above with the dark spots reduced; the light bars on the outer webs of the primaries are usually broader and better defined; on the under parts these birds have a strong rufous wash, but very little vermiculation. Birds from *Sumatra* are intermediate. A single adult from *Java* has an almost solidly black crown and, although very dark, is more grayish than rufous.

Quite different is a series of two males and one female from *Kangean Island*. All three birds are very light both above and below. The female is somewhat washed with rufous below, the males almost whitish, with the streaking about as much developed as in Sumatra birds. The black spots on back and crown are very small and the collar and the scapular patches are very light. I propose to call this new form.

Otus bakkamœna kangeana, new subspecies.

Type.—No. 629863, Amer. Mus. Nat. Hist. (Rothschild Collection); ♂ ad.; N. E. Kangean; September, 1901; Prillwitz coll.

Wing, ♂ 146, 147, ♀ 152; tail, ♂ 68, 69, ♀ 70.

Strix leptogrammica leptogrammica Temminck

3 ♂ ad., 2 ♀ ad., 1 ♂ juv., 1 ♀ juv., Parit; 1 ♂ ad., 1 ♀ ad., Riam; wing, ♂ ad., 292, 293, 300, 300, ♀ ad. 298, 298, 312; tail, ♂ 153, 153, 158, 165, ♀ 155, 158, 164.

The present series, which was collected not very far from Pontianak, the type locality of this species, is very welcome, because it shows that the north Borneo birds which have always been identified as *leptogrammica* really belong to an undescribed race.

Strix leptogrammica vaga, new subspecies

Type.—No. 630821, Amer. Mus. Nat. Hist. (Rothschild Collection); ♂ ad., Benkoker, north Borneo; October 15, 1885; Whitehead coll.

Similar to *S. l. leptogrammica*, but averaging larger; entire coloration duller, more grayish brown, less rufous; light bars on upper parts less well defined, narrower, pale brown, not tawny; light bars on wing and tail-feathers narrower and less rufous; throat and upper breast darker brown; abdomen more whitish, not suffused with ochraceous.

Wing, ♂ ad., 305, 313, 315, ♂ imm., 328, 329, ♀ imm., 335; tail, ♂ ad., 153, 160, 165, ♂ imm., 178, 180, ♀ imm., 180.

Range.—North Borneo (Benkoker and Sandakan).

The immature specimens are rather interesting, not only on account of their larger size, but also on account of their coloration. Throat, breast, and sides of the neck lack the uniform rufous-brown coloration, instead of which these parts are barred, very much like the remainder of the under parts, but much washed with rufous; the rufous collar on the hind-neck is very inconspicuous; the crown is paler brown.

A single adult male from Mt. Dulit (wing 297, tail 158) is in some characters closer to *vaga*, in others to *leptogrammica*. On the whole, it is closer to typical *leptogrammica*.

Psittacula longicauda longicauda (Boddært).

3 ♂ ad., 1 ♂ imm., 4 ♀, Parit; wing, ♂ ad. 154, 156, ♂ imm. 148, ♀ 145, 147, 147, 148; tail, ♂ ad. 244, ♂ imm. 221, ♀ 142, 157, 181.

It may be mentioned at this occasion that the *P. alexandri* from Kangean seem to belong to *dammermani* Chasen and Kloss (wing, ♂ 164, ♀ 158, 159; tail, ♂ 185 +, ♀ 156, 172) (Rothschild Collection).

Batrachostomus stellatus parvulus Schlegel

3 ♂, Riam; wing 117, 122, 123; tail 114, 115.

Borneo birds are darker and more rufous above (in the rufous phase) than Malay Peninsula specimens; the belly and the under tail-coverts are clearer white, less buffy and throat and breast are darker brown, contrasting more distinctly with the lower belly. The size averages smaller; wing, 117, 119, 120, 122, 123, 123, against 118, 119, 122, 122, 123, 123, 124, 124, 128, 134 in Malay Peninsula specimens.

The name *parvulus* Schlegel (ex Temminck M.S.) was based on two specimens (Junge *in litt.*), a female from the Kapoeas River (Borneo), collected by Schwaner, and a male from Malacca without collector. I hereby restrict the type locality to Borneo, making the Kapoeas specimen the virtual type, and making the name *parvulus* available for the Borneo population.

Eurystomus orientalis calonyx Sharpe

2 ♂, 2 ♀, Riam; wing, ♂ 190, 203, ♀ 194; tail, ♂ 95, 98, ♀ 96.

Ramphalcyon capensis javana Boddært

3 ♂ ad., Riam; 1 ♂ imm., Parit; wing, 3 ♂ ad., 138, 142, 146, 1 ♂ imm. 132.

Alcedo meninting verreauxi De La Berge

1 ♀, Riam; wing 65, tail 26.

See also Junge, 1936, Temminckia, I, p. 34.

Ceyx rufidorsus Strickland

1 ♀ ad., 1 ♀ imm., Riam; wing 60, 59; tail, 23, 23.

Halcyon concreta borneana Chasen and Kloss

2 ♂ ad., Riam; wing, 110, 112·5, tail 54, 56.

Specimens in the Rothschild Collection do not show as clear cut a separation between *concreta* and *borneana* as shown by the material in the Raffles Museum. The measurements are: North Borneo, ♂ 111, 112, 113, 113, 118; South Borneo, ♂ 110, 112·5; Malay Peninsula, ♂ 106, 108, 110, 112·5; Sumatra, ♂ 104, 106, 108, 111.

Buceros rhinoceros borneoensis Schlegel and Müller

1 ♂, Parit; 3 ♂, 1 ♀ Riam.

MEASUREMENTS

		Wing	Bill
Borneo ..	.. 6 males	459–494 (477.8)	233–247 (237.8)
Malay Peninsula	.. 4 males	482–493 (487.8)	240–262 (249.8)
Sumatra ..	.. 2 males	511, 526 (518.5)	252, 258 (255.0)
		Horn (sector)	
		132–151 (144.2)	
		156–201 (177.0)	
		160–177 (168.5)	

The Borneo race is well substantiated by these measurements. The horn is measured at its greatest diameter, which makes the strongly curved horn of the Borneo race appear smaller than it actually is. The horn of birds from the Malay Peninsula is longer, lower and straighter. The above given measurements (particularly those of the wing) indicate that the Sumatra birds belong to a race different from the typical race. The name *sumatranus* Schlegel and Müller is available for this race.

Anthracoceros coronatus convexus (Temminck)

1 ♂, 1 ♀, Parit; 3 ♂ ad., 1 ♂ juv., 2 ♀ ad., Riam.

TABLE OF MEASUREMENTS (Adults only):

		Wing	Tail	Bill	Horn
Borneo	♂	302, 306, 309, 318	285, 287, 289, 290, 312	134, 141, 146, 150, 158, 161	133, 137, 140, 146, 164, 177
	♀	278, 279, 284	251, 275	120, 120, 129	82, 83, 98
Natuna	♂	298, 313, 313	288, 289, 295	144, 148, 151	140, 142, 164
	♀	283	248	120	104
Java	♂	(303), 315	281, 292	140, 140	144, 160
	♀	276	254	114	81
Sumatra	♂	287, 293, 296, 299, 300, 312	258, 266, 268, 273, 296	138, 138, 140, 147, 147, 148	136, 138, 147, 148, 149, 172
	♀	276, 277	244, 278	117, 118, 121	81, 82, 88
Malay Peninsula	♂	289, 297	275, (282)	127, 134	132, 140

Oberholser has described a race *barussensis* from the Batu Island, on account of their large size. The two adult males on which the original description was based have according to Riley a wing length of 315, 315 mm. (Proc. U. S. Nat. Mus., Vol. 75, Art. 4, p. 17). The birds do not exceed in size the above mentioned Java bird, and are practically of the same size as Natuna birds, while one Borneo specimen is even larger.

Oberholser has also separated the Natuna birds under the name *zamelaena* (Bull. 159, U. S. Nat. Mus., p. 38) based on larger size and greater extent of the black patch on the casque as compared with the typical Sumatra bird. The size difference appears very small, we find in our specimens an almost complete overlapping of measurements (*see* attached tabulation).

There is considerable variation in the size of the black patch on the casque, but in our adult Natuna birds the black always crosses the dividing line between casque and maxilla, which never occurs so extensively in birds from other islands. Oberholser does not mention that there are also certain minor differences in regard to the extent of black between birds from the other islands. Bornean birds have a considerable amount of black, it always runs back along the culmen of the casque some distance from the tip. In Sumatra birds there is somewhat less black though there is some variation, and in our two adult males from the Malay Peninsula, there is no black at all along the culmen of the casque. If this character proves constant, the Malayan population would have to be called *intermedius*.

Anthracoceros malayanus (Raffles)

1 ♂ ad., 2 ♂ imm., 2 ♀ imm., Parit; 2 ♂ ad., Riam; ♂ ad., wing 304, 307, 330, tail 307, 315, 322; bill 139, 144, 145; casque 129, 143, 148.

Cranorrhinus corrugatus corrugatus (Temminck)

1 ♂, Parit; wing 385, tail 263, bill 150.

A single male from Toentoengan, Dulit, northeast Sumatra is very much larger than a series of Borneo specimens (wing 417, tail 289, bill 158) and indicates that the Sumatra birds also belong to *megistus* Oberholser (Batu Islands).

Anorrhinus galeritus minor, new subspecies

Type.—No. 446824, Amer. Mus. Nat. Hist.; ♂ ad., Parit; Sampit, south Borneo; July 2, 1935; J. J. Menden coll.

Similar to *A. g. galeritus*, but much smaller.

TABLE OF MEASUREMENTS (Adults only):

			Wing	Tail	Bill
South Borneo ..	4	♂	337, 341, 344	256, 257, 259	111–114 (112.7
(Parit) ..	9	♀	308–334 (320.1)	241–273 (252.2)	96–112 (103.0)
Sumatra ..	3	♂	350, 355, 356	276, 277, 281	125, 125, 128
(typical) ..	3	♀	332, 334, 335	(258), 261 ,(263)	113, 116, 121
Malay Peninsula ..	1	♂	345	279	123
	2	♀	328.5, 330	264.5, 257	103, 120
Natuna Is. ..	1	♂	352.5	278	121
	1	♀	325	—	106
North Borneo ..	1	♂	355	300.5	128
	2	♀	351, 361	276, 289	119.5, 124
Sarawak ..	1	♀	333	254	105

Birds from Sumatra (type-locality), the Malay Peninsula, the Natuna Islands and north Borneo belong to the large typical race; the single female from Sarawak apparently belongs to the small race. There is some overlap in the measurements of the females, but south Borneo males are consistently smaller (in wing and bill) than birds from the rest of the range. A single male from Pontianak measures wing 320 (fide Kloss) and is undoubtedly *minor*. Summarized the measurements of adult males are as follows:

South Borneo, wing, 320*, 337, 341, 344, rest of the range, wing, 345, 350*, 350*, 350, 352·5, 355, 355, 356; South Borneo, bill, 111, 112, 113, 114, rest of the range, bill, 121, 123, 125, 125, 128, 128.

Neumann (*in litt.*) called my attention to the "reddish or chocolate colored" under parts of the type of *galeritus*. This is apparently only a reddish stain either from the hollows in which these birds nest or from fruit which they eat. There is about an equal proportion of gray and reddish stained birds in our series from the Malay Peninsula, Sumatra and Borneo. In some molting specimens the fresh feathers are gray, the old ones stained.

Rhinoplax vigil (Forster)

1 ♂, Riam; wing, 461; tail, 778; bill (fr. gape), 156; culmen of horn, 80.

Merops viridis viridis Linnæus

3 ♂ ad., 2 ♂ imm., 1 ♀ imm., Riam; ♂ ad., wing, 112, 112, 113; tail, 74, 77, 81.

Nyctiornis amictus (Temminck)

4 ♂, 4 ♀, Riam; wing, ♂ 127, 128, 130, 130; ♀ 118, 122, 123, 126.

Lyncornis temminckii Gould

1 ♂ imm., 1 ♀ ad., Parit; 1 ♂ ad., Riam; wing, ♂ ad. 215, ♀ ad. 207.

Caprimulgus concretus Bonaparte

1 ♂, Parit; wing, 162, tail, 94.

Harpactes diardii diardii (Temminck)

3 ♂ ad., 1 ♂ imm., Parit; 1 ♀ ad., Riam; wing, ♂ ad. 144, 145.

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* *See* Treubia, vol. XII, p. 402, and vol. XIV, p. 13.

Harpactes kasumba impavidus (Chasen and Kloss)

3 ♂ ad., 1 ♀, Parit; 1 ♂ ad., Riam; 4 ♂ ad., wing 138, 139, 139, 139.

Harpactes duvaucelii (Temminck)

2 ♂ ad., 2 ♀ imm., Parit; 3 ♂ ad., 3 ♀ ad., Riam; wing, ♂ ad., 103·5, 104, 104, 104, 105, ♀ ad. 102, 103, 105.

There seem to be three plumages in this species, a downy nestling plumage, an immature plumage and the adult plumage. Two females (from Parit) in the immature plumage have the back, particularly the upper back, much mixed with grayish.

Cuculus micropterus micropterus Gould

1 ♀, Riam; wing 206; tail (158).

Cuculus micropterus concretus S. Müller

1 ♂, Riam; wing——; tail 130.

Cuculus (Hierococcyx) fugax Horsfield

The fact that this species shows some geographical variation, has been realized for some time. Hartert (1912, Vögel. pal. Faun., II, p. 953) admitted two races, the migrant *nisicolor* from the Palearctic, and the large-billed sedentary *fugax* of Malaysia. The extract characters and the winterquarters of *nisicolor* were not clear to him, but were largely cleared up by Chasen and Kloss (1927, Journ. Fed. Malay Stat. Mus., XIII, pp. 277–279). These authors quote five characters as separating the two forms. The next step toward the understanding of this species was that Stresemann and Kinnear showed in 1930 (Journ. f. Ornith., p. 306) that *hyperythrus* was a valid race, which represented the species in south-east Siberia, northern China and Japan. At the same time Siebers showed (May, 1930, Treubia, p. 136) in a very thorough paper that not only was *hyperythrus* a valid form, but also that the Philippine race *pectoralis* Cab. and Heine was probably valid. All these conclusions have been fully substantiated by a material of 49 specimens before me, representing all four forms. This material had not yet been examined in the light of our recently gained knowledge and has contributed several important details, in particular in regard to the characters of *pectoralis* and in regard to the plumages of this species.

Cuculus (Hierococcyx) fugax fugax Horsfield

Specimens examined:

5 ♂ ad.: Deli, Sumatra, May 2, 1917, van Heyst; Great Karimon Island, E. Sumatra, May 27, 1903, W. L. Abbott; Pulu Pini, Batu Island, Oct.–Nov., 1906, J. Z.

Kannegieter (van der Poll Coll.); Riam, Borneo, Nov. 1, 1935, J. J. Menden; "Borneo", Dr. Wilson Coll., Philadelphia (no further data).

5 ♂ imm.: Central Borneo, 1899, A. W. Nieuwenhuis; Karimata Island, W. Borneo, August 21, 1904, W. L. Abbott; Tarussan Bay, W. Sumatra, Jan. 18, 1905, W. L. Abbott; Banka Island, May 28, 1904, June 6, 1904, W. L. Abbott.

7 ♂ juv.: Tijching, Trong, lower Siam, July 22, 1896, W. L. Abbott; Temangoh, upper Perak, July 25, 1909, Mus. Civ. Selangor (H. C. Robinson); Gunong Tahan, Malay Peninsula, Nov. 1901, J. Waterstradt; Malacca (native skin); Pulu Bintang, Rhio Arch., Aug. 6, 1902, W. L. Abbott; Siberut Island, W. of Sumatra, Oct. 1, 1924, C. Boden Kloss; Batu Sangkar, Padang highlands, Sumatra, Aug.-Sept., 1901, A. C. Harrison and H. M. Miller.

2 ♀ ad.: Batu Sang, Baram River, Borneo, March, 1892, Ch. Hose; one specimen without locality.

Range.—Malay Peninsula from lower Siam on, Rhio Archipelago, Sumatra, islands off Sumatra (Gt. Karimon, Batu, Siberut), Banka and Biliton, Java, Karimata Islands, and Borneo. Not migratory.

Adult male.—Crown, back, scapulars, upper wing-coverts dark slate-gray; feathers on lower back and rump sometimes with brownish edges; wing-feathers, particularly secondaries, sometimes with faint brownish bars; breast and upper belly with narrow dark gray streaks, which are narrowly or broadly bordered with rufous or vinaceous red on breast and flanks; central tail-feathers with broad rufous tips and a fairly broad subterminal black band followed by a broad grayish band (*see* Siebers, l. c., p. 137, fig. 8 *a*); light bands on tail not perceptibly washed or bordered with rufous; white spots on sides of nape pronounced; under wing-coverts and axillaries practically immaculate, wing round, third and fourth primary subequal; bill much longer; the black on the mandible restricted to a small area near the tip.

Immature male (? first year plumage).—Similar to the adult male, but the slate gray restricted to the crown, back, scapulars and upper wing-coverts dark brown, slightly variegated with rufous brown bars; rufous bars on wing-feathers more distinct; tail as in adult; under parts more heavily streaked.

Juvenile male.—Entire upper parts, and upper wing-coverts particularly the crown dull sooty brown, each feather with a buffy white margin; feathers of under parts with a white base, a sooty tip and a buffy white margin; the tail-feathers are more pointed and tipped with white. This plumage is lost by a complete molt of body plumage, wing and tail.

Adult female.—Very similar to immature male and not with certainty separable; rufous bars on back, scapulars, upper wing-coverts and wing apparently more pronounced; less rufous on the breast.

Measurements:—Ad. males, wing 169, 171, 176, 178; culmen 25–26; wing-tip index[1] 25·4, 25·6, 26·7, 28·1, 31·5, av. 27·5; imm. males, wing 166, 174, 176, 178; wing-tip index 27·5, 28·4, 28·7, 28·9; adult females, wing 170, 172, wing-tip index 27·6, 29·1.

Remarks.—The fact that several specimens were collected in Malaysia during the breeding season of *nisicolor,* and that no specimen of this form was collected north of the isthmus of Trang makes it reasonably certain that this form is breeding in Malaysia, and that Chasen's doubts are unfounded (*see* Handlist Malays. Birds, p. 123). Besides the majority of the specimens examined by me are males, which indicates clearly that the subspecific characters of *fugax* are not those of the female sex (*see* Chasen, l. c.). Not enough adult specimens have been examined by me to indicate whether or not there is any geographical variation within the range of *fugax.* It is possible that Borneo birds have less rufous on the breast than specimens from the Malay Peninsula and Sumatra. Chasen and Kloss (l. c., p. 278) did not have a single adult, gray backed *fugax,* and the frequency with which this brown backed plumage occurs, which I have described above as "immature", might raise the question whether it is not a retired plumage, which might occur in adult specimens. The fact that two of my five specimens molt into the gray-backed plumage and none into another brown backed plumage makes me reasonably certain that this is a true first year plumage, and not a "retarded" plumage.

The shortness of the wing-tip of this form is the best proof that it is stationary and not a migratory visitor to Malaysia. In order to provide comparable measurements, I have divided the distance between longest secondary and longest primary by the total wing-length and call this the *wing-tip index.* The two resident forms *fugax* and *pectoralis* have the shortest index; *nisicolor* with a short migration route has it longer and *hyperythrus* which comes from Siberia down to the tropics, has by far the largest wing-tip index.

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[1] For explanation of this term see below.

Cuculus (Hierococcyx) fugax nisicolor Blyth

Specimens examined:

4 ♂ ad.: Sikkim, April, 1874, ex Elwes coll.; Langkat, Sumatra, Feb. 19, 1918, van Heyst; Pangkalahan River, south-east Borneo, February 6, 1908, L. W. Abbott (sexed as female, *see* below); Kina Balu, January 16, 1888, J. Whitehead.

2 ♂ imm. (?): Kalaw, south Shan States, April 11, 1912, (labelled female); Padang highlands, May 31, Dr. Klaesi (labelled female).

4 juv.: Sikkim, July, 1874, ex Elwes coll.; Margherita, upper Assam, June, 12, 1902, H. N. Coltart; Leng-chi, Kham, western China, August 17, 1934, Ernst Schäfer; Tachang Tai, Raheng, Siam, July 15, 1924, J. H. Chambai.

2 ♀ ad.: Khaw Sai Dow, Trong, lower Siam, February 11, 1899, L. W. Abbott; Pulu Jemor, Straits of Malacca, November 14, Mus. Civ. Selangor (Herbert C. Robinson).

Range.—From Nepal, Sikkim and south China, south through Burma and Indo-China to Siam.—On migration and during the winter in the Malay Peninsula, Sumatra, Java, and Borneo.

Adult male.—Entire upper parts, including rump, upper wing-coverts, scapulars, and secondaries blue gray; wing-feathers without brownish bars; breast, belly, and flanks with dark or pale gray triangular marks, which are broadly bordered with rufous; central tail-feathers with narrower rufous tips and a fairly broad subterminal black band, followed by a narrow gray band (*see* Siebers, l. c., p. 137, fig. 8 *b*); light bands on tail not perceptibly washed or bordered with rufous ; white spots on side of nape not as pronounced as in *fugax;* under wing-coverts and axillaries marked with dark bars; bill much shorter than in *fugax;* much more black in the middle of the mandible, wing more pointed, third primary longer than the fourth.

The south-east Borneo bird is a female according to the label, but it has wings and upper parts as blue gray as the three certain males. On the under parts this specimen is distinctly more streaked, less rufous than the three males. It is possible that this is the typical adult female plumage, a suspicion strengthened by the Shan bird, discussed below.

Immature male (?).—Similar to that of *fugax,* but differing by the shorter bill, the narrow subterminal light bar on the tail, the more pointed wing and the barred under wing-coverts and axillaries. The light bars on the tail are slightly washed with rufous and the feathers of the back, the scapulars, upper wing-coverts and wing-feathers are conspicuously marked with rufous. There is apparently no difference in the under parts which is not overbridged by individual variation.

Both specimens are sexed "female" and may be immature females. The Shan bird is molting the back toward the the adult plumage and all the new feathers are uniform bluish slate gray. Either this specimen is wrongly sexed or the adult female of the race *nisicolor* has the back blue gray like the male. The Padang bird is not molting but the rufous markings of the upper parts lack the regularity which I consider typical for the adult of this species. More reliably sexed material of adult females must be examined before we can reach certainty about these plumages.

Juvenile.—With the usual juvenile characters of this species (*see* above, under *fugax*) and with the characteristic features of this race (short bill, narrow subterminal light bar and barred under wing-coverts and axillaries).

Female.—With the above mentioned characters of this subspecies. Crown gray, rest of upper parts and wing lighter than in two females of *fugax* and with numerous and regular rufous bars. The light bars of the tail bordered with rufous. It is possible, that this is the plumage of the immature female, and that the adult female of the race *nisicolor* has the back blue gray.

Measurements:—Adult male.—Wing, 179·5, 181, 181, 185; culmen 22–23; wing-tip index 30·1, 32·2, 32·6, 33·7; av. 32·2. These measurements show, that *nisicolor* is distinctly larger (179·5–185) than *fugax* (169–178).

The single juvenile from Kham, western China (Dolan-Schäfer expedition) has a wing of 186, which is considerably larger than that of the other juveniles of this species. This bird is possibly intermediate between *nisicolor* and *hyperythrus*. Its wing-tip, however, is very short.

Cuculus (Hierococcyx) fugax hyperythrus Gould

Synonym.—*Cuculus asturinus* Brüggemann.

Specimens examined:

2 ♂ ad.: Shimotsuke-no-kuni, Japan, Allan Owston; Kina Balu, Borneo, April 26, 1888, J. Whitehead.

2 ♂ subad.: Kina Balu, Borneo, April, 1888, J. Whitehead.

1 ♀ juv.: Shimotsuke-no-kuni, Japan, Allan Owston.

Range.—South-east Siberia, Manchuoko, north China (Chili), Japan.—On migration through south China to Borneo, Celebes, and Buru. Possibly also on the Philippines, but no specimens seen.

Adult male.—Entire upper parts blue gray; breast, belly and flanks uniform reddish, without any streaks or spots; rufous tip of tail short, first light subterminal bar very narrow and rufous gray, each light bar on the tail bordered with pale rufous gray at the proximal end; under wing-coverts and axillaries immaculate in one and slightly barred in the other specimen; bill almost as short as in *nisicolor;* mandible almost entirely yellow; wing pointed, third primary considerably longer than fourth; wing-tip (distance between longest secondary and longest primary) very much longer than in *nisicolor;* size much larger than in *fugax* and *nisicolor.*

Subadult males.—Both birds are molting from the immature to adult plumage. The immature plumage is apparently heavily streaked underneath and brownish above and on the wings with generous rufous barring. The tail is similar to that of the adult.

Measurements:—Wing, ♂ ad., 205, 213, ♂ imm., 207, 212, ♀ juv., 184; culmen, 26, 27, 27·5; wing-tip index, ♂ ad., 34·7, 36·6, ♂ imm., 31·4, 33·0.

For remarks on the type *see* Journ. f. Ornith., LXXVIII, p. 306.

Cuculus (Hierococcyx) fugax pectoralis Cabanis and Heine

Specimens examined:

3 ♂ ad.: Laguna de Bai, Luzon, January, 1895, January 14, 1895, A. Everett; Mt. Mariveles, Bataan, Luzon, January 1, 1915, John T. Zimmer.

2 ♂ imm.: Mt. Mariveles, Luzon, April 2, 1915, John T. Zimmer; Toledo, Cebu Island, June 17, 1892, Worcester and Bourns.

1 ♀ ad.: Subaan, Mindoro, December 5, 1906, E. A. Mearns.

2 ♀ imm.: Manila, Luzon, January 18, 1914, John T. Zimmer; Mt. Maguiling, Laguna, Luzon, October 4, 1914, John T. Zimmer.

Range.—Philippine Islands.

Adult male.—Similar to *hyperythrus*, but much smaller; chin and ear-coverts lighter gray, breast and flanks much deeper and richer vinaceous red; feathers of flanks sometimes with triangular pale gray spots; lower belly, crissum and under tail-coverts pure white; tail rather similar to that of *hyperythrus*, but subterminal black bar rather narrow, subterminal light bar broad, but not quite as broad as in *fugax;* alternating black bars very narrow; each light bar bordered at its proximal end by a pale rufous margin; white spots on sides of nape absent; under wing-coverts and most of the axillaries immaculate, longest axillaries barred, all axillaries rufous; wing very round, third and fourth primary subequal, wing-tip very short; bill heavy, but very short; the greater part of the mandible blackish.

Immature male.—Rather similar to that of *nisicolor*, but back less brown, more blue-gray, heavily barred with rufous; black bars on tail narrower, subterminal light bar averaging wider; under wing-coverts and axillaries almost immaculate; wing rounder and wing-tip shorter; differs from *fugax* by the rufous bars on the tail, by the heavy rufous markings on the upper parts and by the much shorter bill.

Adult (?) female.—Upper parts grayish, each feather of back and rump with a rufous tip, and with indistinct rufous bars; scapulars, upper wing-coverts and wing-feathers with conspicuous rufous bars; under parts heavily streaked and with a generous rufous wash; tail as in male, but with much more rufous; under wing-coverts practically immaculate; other subspecific characters (size, wing, bill, etc.) as in male. This may be the complete immature plumage.

Immature female.—Similar to adult (?) female, but back more brownish, less grayish.

Measurements:—Wing, ♂ ad., 171, 174, 175, ♂ imm., 172, 178, ♀ ad., 171, ♀ imm., 169·5, 171; tail, ♂ ad., 155, 155; culmen, ♂ ad., 23, 25, 25; wing-tip index, ♂ ad., 23·7, 24·1, 25·7, ♂ imm., 24·4, 25·6, ♀ ad., 26·3, ♀ imm. 23·0.

Centropus sinensis bubutus Horsfield

3 ♂ ad., 1 ♂ imm., 2 ♀ ad., Parit; 2 ♂ ad., 2 ♀ ad., Riam; wing, ♂ ad., 203, 204, 207, 210, 217, 227, ♀ ad., 222, 231; tail, ♂ ad., 248, 273, 276, 277, 280, ♀ ad., 265, 270, 288, 294.

Worn birds have a purplish gloss on the head, fresh birds a bluish one. I cannot confirm the characters of *eurycercus* as stated by Chasen and Kloss (Ibis, 1926, p. 284). The shade of brown on the mantle is also much influenced by individual variation and by wear. Fresh birds from south Borneo, however, have it rather light colored, and Kangean specimens rather deep chestnut. The variation of size is also subject to a great deal of individual variation, as shown by the above series. Birds from Kangean, Java and Borneo average distinctly smaller than birds from the Malay Peninsula, particularly in regard to the length of the tail. The name *eurycercus* may be accepted on the basis of this character (length of tail usually above 300).

Rhopodytes sumatranus (Raffles)

2 ♂, 4 ♀, Parit; 2 ♂, 2 ♀ Riam.

South Borneo birds average smaller than birds from the Malay Peninsula, but I have not seen enough specimens from north Borneo or Sumatra, to say anything about their variation.

MALES

South Borneo.—Wing, 136, 139, 142, 142; tail, 206, 209, 210, 216.

Malay Peninsula.—Wing, 141, 141, 142, 144, 149; tail, 213, 217, 218, 222.

FEMALES

South Borneo.—Wing, 135, 135, 139, 142, 145; tail, 209, 214, 221, 222.

Malay Peninsula.—Wing, 139, 142, 142; tail, 221, 226, 233.

There is too much overlap to separate these populations by names.

Rhinortha chlorophæa subspecies

3 ♂ ad., 1 ♂ imm., 2 ♀, Parit; 1 ♂ ad., 1 ♀ ad., Riam.

Chasen and Kloss (1930, Bull. Raffles Mus. Singapore, No. 4, p. 32) state that a series of females from north Borneo and a series of females from the Malay Peninsula shown an equal amount of individual variation, indicating a perfect intergradation between the two extremes: gray throat and buffy ferrugineous throat. With only one female from Sumatra available, they could not state, whether or not this same amount of variation held true for birds from the type-locality.

On the basis of my material, I come to a different conclusion. Of seven north Borneo females, four belong to the buffy ferrugineous phase (but *see* below!), three to the buffy grayish throated phase, of eight Malay Peninsula females, two have the throat buffy gray and six pure gray, and all eight Sumatra females have the throat pure gray. But what is more important still, Borneo birds differ in several other characters from birds from Sumatra and the Malay Peninsula. The species *Rhinortha chlorophaea* can be divided in at least two, but possibly three races.

Rhinortha chlorophæa chlorophæa Raffles

Range.—Sumatra (type-locality), Banka (subsp.?) and Malay Peninsula.

Characters.—Ad. male.—Size large, tail long; rump fuscous, with a mottling of sandy cinnamomeous or rufous; tail black with conspicuous gray bars; mantle and wings rather dark and rufous (less so in Malay Peninsula specimens).—Ad. female.—Throat and chin gray, rarely with a slight buffy tinge; white tips on tail-feathers broad; back, wings and tail rather deep rufous.

Rhinortha chlorophæa fuscigularis Stuart Baker

Range.—Sarawak (type-locality), northern Borneo (subsp.?), North Bornean Islands (subsp.?), and south Borneo (subsp.?).

Character.—Ad. male.—Size small, tail short; rump and tail black with narrow, inconspicuous fuscous bars; nape, mantle and wing of a paler, more chestnut rufous throat rather bright ochraceous.—Ad. female.—Throat and chin buffy cinnamon, not pure gray; gray crown also with buffy tinge, more so on the nape which is distinctly cinnamomeous; back, wings and tail tending toward chestnut; white tips of tail-feathers averaging narrower.

Remarks.—All the four specimens of a series of females collected by Everett in "Borneo" (= north Borneo or Sarawak) are of the rufous type, while a female from Benkoker and two from Sandakan are buffy gray or gray. All three females from south Borneo belong to the grayish type, with no buff on crown and nape and very little buffy wash on the throat. Of a series of twelve females from the Berau and Sangkulirang Rivers, east Borneo (Raven coll.) ten have a gray and two a buffy gray throat, but not one a buffy cinnamon throat, as the Sarawak series.

The specimens examined by me and a study of the literature indicate that there are probably two races of this species in Borneo which agree in their small size and the dark coloration of rump and tail, but differ in the coloration of the females. Birds from Sarawak and north-west Borneo have the throat rufous in the female plumage, while females from south and east Borneo have a gray or buffy gray throat. Both races meet in north Borneo, where a mixed population is found. More material from all parts of Borneo must be examined before the gray throated race from south and east Borneo can be named.

—	Wing	Tail
Rh. chl. chlorophaea		
Sumatra 4 ♂	114–116 (115.0)	162–169 (165.5)
5 ♀	112–122 (115.6)	163–175 (170.4)
Malacca 4 ♂	112–118 (114.4)	161–176 (165.7)
5 ♀	112–120 (116.3)	163–182 (171.7)
Rh. chl. fuscigularis		
N. Borneo 7 ♂	108–115 (112.5)	157–164 (160.6)
7 ♀	111–117 (114.0)	156–166 (160.8)
S. Borneo 4 ♂	110–113 (111.8)	153–159 (157.2)
3 ♀	114–116 (115.0)	160–163 (161.2)

Phœnicophaus curvirostris borneensis (Blasius and Nehrkorn)

2 ♂ ad., 1 ♀ ad., 1 ♀ imm., Parit; 2 ♂ ad., Riam; wing, ♂ 158, 160, 165, 169, ♀ 160, 161; tail, ♂ 213, 229, 232, 241, ♀ 220, 245 (imm.).

There are no significant differences either in size or coloration between birds from south and north Borneo. The nostrils of south Borneo birds are usually shorter and rounder, while they are longer and more slit-like in north Borneo birds. The two females have chin and cheeks gray, the four males not.

Carpococcyx radiatus radiatus (Gray)

5 ♂, 1 ♀, Riam; wing, ♂ 249, 252, 255, 260, ♀ 246; tail, ♂ 277, 291, 296, 302, 305, ♀ 284.

Chotorhea chrysopogon chrysopsis (Goffin)

1 ♂, 1 ♀, Riam; wing, ♂ 120, ♀ 120·5.

I fail to see how *laeta* Rob. and Kloss (Malay Peninsula) can be maintained as different from typical *chrysopogon*. There is too much overlap in the colour of the "whiskers" which average paler in the Sumatra bird, and in size, in which the Sumatra bird averages slightly larger (wing 127–137, against 127–130 of Malayan birds in my material).

Chotorhea mystacophanes mystacophanes (Temminck)

1 ♂, 1 ♀, Riam; wing, ♂ 95, ♀ 96.

I fail to see any differences between Borneo and Sumatra birds, but see Chasen and Kloss, 1932, Treubia, XIV, p. 14.

The single female from Riam is quite different from any other female in our collection. The forepart of the crown and the throat are very bluish, the red spot on the crown small, and there are no red spots on the side of the neck. The bird is fully adult. More material from south Borneo is required to understand this variation.

Chotorhea rafflesii borneensis Blasius

5 ♂, 3 ♀ Parit; 1 ♂, 1 ♀ Riam; wing, ♂ 108, 109, 113, 115, 115, 118, ♀ 112, 115, 116, 117.—This series measures smaller than average Borneo birds.

Cyanops australis duvaucelii (Lesson)

1 ♂ ad., 2 ♀ ad., 3 ♀ imm., Parit; 1 ♂ ad., 1 ♀ ad. Riam.

Cyanops eximia Sharpe is quite a different species. I do not understand why Harrison and Hartley and recently Chasen reduce this mountain species to a subspecies of the widespread *australis*.

Picus puniceus observandus (Hartert)

1 ♀ ad., Parit; 1 ♂ ad., 1 ♀ subad., Riam; wing, ♂ 123, ♀ 116, 119 (ad.).

Borneo birds measure 116–128, Sumatra birds 119–128 (acc. to Stresemann 118–135 (127·9)) and birds from the Malay Peninsula 122–133 (123–136 acc. to Rob. and Kloss). These figures show clearly that the Malay Peninsula birds, although averaging slightly larger, cannot be recognized as a separate race (*continentis* Robinson and Kloss). Borneo birds average smaller than either Sumatra or Malay Peninsula birds.

Callolophus mineaceus dayak Stresemann

1 ♂ ad., Parit; 1 ♀ ad., Riam; wing, ♂ 120, ♀ 123; tail, ♂ 68.

The Parit bird has some red on back and nape, which might be interpreted as a tendency toward typical *mineaceus*. The Rothschild Collection has, however, similar specimens from Sumatra and the Malay Peninsula.

Chrysophlegma mentale saba Chasen and Kloss

4 ♂, Parit; 1 ♂, 1 ♀ Riam; wing, ♂ (Parit) 126, 128·5, 129, 130·5, (Riam) 132, ♀ 126; tail, ♂ (Parit) 85, 90, (Riam) 90.

These birds are in size intermediate between *humei* and *saba*, but nearer to *saba*, with which they also agree by the greenish tinge on the black of the speckled malar region. The more westerly Riam bird is closer to *humei*, it is larger and has less of the greenish tinge.

Chloropicoides rafflesii borneoensis (Hesse)

1 ♂ ad., Parit; 1 ♂ ad., Riam; wing, 138, 140; tail, 102, 103.

These measurements exceed those generally given for this form (123–136).

Dryobates hardwickii aurantiiventris (Salvadori)

1 ♀, Riam; wing, 78.

Meiglyptes tristis micropterus Hesse

4 ♂ ad., 1 ♂ imm., 3 ♀, Parit; wing, ♂ ad., 85, 88·5, 90, 92, ♀ 87, 88, 90.

Meiglyptes tukki percnerpes Oberholser

2 ♂ ad., 3 ♂ juv., 1 ♀ juv., Parit; wing, ♂ ad., 100, 102, ♂ juv. 98, 99, 99, ♀ 95.

This is a very difficult species and even after the examination of 69 specimens from all parts of the range, I have been unable to come to any final conclusion. The two greatest difficulties are the wide individual variation and the rapid foxing. Fresh series are as different from old series from the same locality as are usually different subspecies. Having assembled all this material it might seem worth while to record my observations on the geographical variation within the species.

Malay Peninsula.—Six adult males have the back darker, less washed with yellow olive, and the buff bars more clearly defined than seven adult males from Sumatra (type-locality of *tukki*). The under parts are also more heavily barred which is particularly evident on the black breast, and is also indicated by the reduction of the unbarred area in the middle of the abdomen.

North Borneo.—An old male from Kina Balu, agrees more or less with Sumatra birds. Three fresh males (Crane Exped.) from Sandakan are well washed with yellowish and more heavily barred than even the Malay Peninsula birds. The entire back is covered with broad buff bars and the unbarred zone in the middle of the belly has practically disappeared.

South Borneo (percnerpes).—Most of the specimens seen by me are either immature or so worn that it is impossible to recognize the essential characters. South Borneo birds are apparently similar to such from the Malay Peninsula, but have almost none of the yellowish olive wash and are more strongly barred. The ochraceous of the bars is frequently tinged reddish. I have been unable to separate some Sarawak birds from the Malayan series. Birds from eastern Borneo seem to agree better with south Borneo specimens than with such from north Borneo.

Bunguran Is. (*azaleus* Oberh.).—Three Natuna birds are so different from birds from the other localities, that it seems possible that Oberholser's subspecies must be recognized. The three birds are rather pale, but strongly washed with yellowish olive; the bars are numerous and broad, but rather vaguely defined.

Micropternus brachyurus badiosus (Bonaparte)

1 ♂ ad., 2 ♂ imm., Parit; 1 ♂ ad., 1 ♀, Riam; wing, ♂ ad., 112, 116, ♀ 114.

A single female from Bunguran, Natuna Is., does not quite agree with any of the described forms, although it is closest to *badiosus*. However the dark centers of the throat feathers are much paler, more rufous, and the light edges narrower and less distinct, giving the throat a nearly uniform rufous appearance; rump and crissum are unbarred, but upper and lower tail-coverts are barred; the lower breast is uniform rufous.

Chrysocolaptes validus xanthopygius Finsch

5 ♂ ad., 1 ♂ juv., 3 ♀, Parit; wing, ♂ 156, 163, ♀ 152, 156, 159.

Hemicircus concretus coccometopus Reichenbach

1 ♂ imm., Riam; wing, 79.

Mülleripicus pulverulentus pulverulentus (Temminck)

1 ♀, Parit; 1 ♀, Riam; wing, 227, 232.

Five Borneo birds are slightly darker than a series of seven birds from the Malay Peninsula, which show an approach toward the pale *harterti*. I have not seen any specimens from Sumatra or Java (type-locality).

Dryocopus javensis javensis (Horsfield)

2 ♂, 3 ♀, Riam; wing, ♂ 231, 236, ♀ 231, 234.

Sasia abnormis abnormis (Temminck)

1 ♂, 4 ♀, Parit; 1 ♂ Riam; wing, ♂ 56, ♀ 52, 54, 55, 55.

Calyptomena viridis viridis Raffles

1 ♀, Parit; 2 ♂ ad., 2 ♀, Riam; wing, ♂ 95, 100, ♀ 100·5, 102, 102.

Eurylaimus ochromalus ochromalus Raffles

2 ♀ ad., Riam; wing, 78, 81.

A series from the Malay Peninsula measures only very slightly smaller than a series from various parts of Borneo, which agrees with the findings of Chasen and Kloss (1930, Bull. Raffl. Mus., No. 4, p. 43). *Eur. ochr. kalamantan* Robinson and Kloss cannot be maintained, since the overlap is more than 50%.

Corydon sumatranus orientalis, new subspecies

Type.—No. 553,211, Amer. Mus. Nat. Hist. (Rothschild Collection); ♂ ad.; Benkoker, north Borneo; July 6, 1885; Whitehead coll.

Similar to *Corydon sumatranus brunnescens* Hartert (Sarawak), but averaging larger and with the throat much paler, buffy, not rufous.

1 ♀, Parit; 1 ♀, Riam; wing, 129, 129.

The race *brunnescens* Hartert, with the deep rufous throat, seems to be restricted to Sarawak and Bunguran, Gt. Natuna Islands. I have seen Borneo specimens from the Baram River and from Balingean. The wing measures 123, 126, 127·5, and 130. The single Natuna bird measures 131. The rest of Borneo seems to be occupied by *orientalis*. In addition to size and color of the throat, our specimens of *orientalis* (including the old specimens collected by Whitehead) are more blackish and with the green edges of the feathers of the upper parts purer green, less olivaceous. Seven adults from Lawas, foot of Kina Balu, Benkoker and Sandakan measure 125, 128, 128, 130, 131, 131, 132. The two birds from south Borneo have a slightly darker throat than north Borneo specimens, but belong unquestionably to *orientalis*. The bills of both birds are very small, although they are adults.

Corydon sum. sumatranus (Raffles)

Differs from the two Borneo races by larger size, much blacker plumage with no rusty and less greenish tinge, and by having the dorsal spot paler, more orange-red, not pure red as the Borneo races.

Cymbirhynchus m. macrorhynchos (Gmelin)

3 ♂, 2 ♀, Parit; 2 ♂, 2 ♀, Riam; wing, ♂ 104, 105, 108, 108, ♀ 105, 105, 107, 108.

Chasen (1935, Handlist of Malaysian Birds, p. 156) states that birds from west Sumatra are the same as those from Borneo, and that birds from east Sumatra agree with such from the Malay Peninsula. According to my material this is not correct.

Four birds from west Sumatra agree perfectly with a series of fifteen from east Sumatra, and both series are distinct from either the Borneo or the Malacca birds. The characters of the three races are as follows:

> *Borneo (macrorhynchos).*—Red of plumage rich and deep, feathers harsh and horny; always some mottling of orange yellow on abdomen; little white on the tail-feathers, in more than half the specimens the tail is all black, never any white on the fourth rectrix (third outermost). In the fresh south Borneo birds the axillaries, the wing-bend, and the spots on the abdomen are very deep orange.
>
> *Sumatra (lemniscatus).*—Red of plumage as in Borneo birds, but orange spotting on abdomen much reduced, being present in only 2 out of 19 specimens; the abdomen is usually pure red; much more white on rectrices, at least the outermost two tail-feathers have white (32%), most birds have 3 white (47%), and some birds have four tail-feathers with white (21%).
>
> *Malay Peninsula (malaccensis).*—Red of plumage paler, feathers softer and duller; tail with a great deal of white; abdomen profusely spotted with orange-yellow.

Pitta nympha nympha Temm. and Schlegel

1 ♀, Riam; wing, 120.

Pitta sordida mülleri Bonaparte

1 ♀, Riam; wing, 106·5.

Pitta granatina granatina Temminck

5 ♂ ad., 1 ♂ imm., Parit; 1 ♂, Riam; wing, 90, 91, 93, 93, 94, 94.

Pitta baudi Müller and Schlegel

1 ♂ ad., 1 ♂ sub. ad., Riam; wing, 98·5 (ad.), 89.

Hirundo tahitica subsp.

1 ♀ imm., Parit; wing, 103.

Muscicapa sib. sibirica Gmelin

1 ♂, Riam; molting.

Cyornis turcosus turcosus Briggemann

1 ♀, Parit; 6 ♂, 4 ♀ Riam; wing, ♂ 73, 74, 75, 76, 76, 78, ♀ 69, 70, 71, 73, 75.

The range of *rupatensis* Oberh. seems to begin a little west of Riam (1932, Treubia, XIV, p. 15).

Hypothymis azurea prophata Oberholser

5 ♂ ad., 2 ♂ imm., 1 ♀ ad., Parit; 1 ♂ ad., 1 ♀ imm., Riam; wing, ♂ ad., 67·5, 69, 70, 70, 70, 72, ♂ imm., 65, 66, ♀ 68.

Rhipidura p. perlata Müller

1 ♂ juv., Riam; wing, 76.

Rhipidura javanica longicauda Wallace

2 ♂ ad., 1 ♀ ad., 2 ♀ imm., Parit; wing, ♂ 74, 80, ♀ 77; tail, ♂ 83, 89, ♀ 88.

These small birds might also be referred to typical *javanica.*

Terpsiphone paradisi borneensis (Hartert)

3 ♂ ad., Parit; 1 ♀, Riam; wing, ♂ 93, 94, 94, ♀ 90; tail, ♂ 277, 378, ♀ 107; all three males are in the white phase.

Drymophila velata cæsia (Lesson)

1 ♀, Parit; 1 ♂ ad., 1 ♀ Riam; wing, ♂ 96, ♀ 92, 97.

Drymophila pyrrhoptera pyrrhoptera (Temminck)

1 ♂ imm., Parit; wing, 80.

Rhinomyias umbratilis umbratilis (Strickland)

1 ♂, Riam; wing, 75.

Smaller than most specimens of this species, but undoubtedly belonging to this species.

Pericrocotus roseus divaricatus (Raffles)

1 ♀, Riam; wing, 99; tail, 97.

Hemipus hirundinaceus (Temminck)

4 ♂, 2 ♀, Parit; 1 ♂, 1 ♀ Riam; wing, ♂ 61, 63, 63, 63, 64, ♀ 62, 64, 64.

I agree with Delacour that this genus belongs to the Campephagidæ and has nothing to do with the Laniidæ.

Aegithina tiphia viridis (Bonaparte)

4 ♂ ad., 4 ♀, Parit; wing, ♂ 58, 60, 60, 61, ♀ 58, 59, 59, 60; tail, ♂ 43, 45, 46, 46, ♀ 45, 46, 46, 48.

The type of *viridis* Bp. was collected in 1826 by Diard at Pontianak, according to information kindly furnished by Dr. G. C. A. Junge. It measures (acc. to Junge): wing, 55·5, tail, 40, culmen, 14, and shows the typical characters of the small greenish south Borneo race. This race goes north as far as Sarawak and at least to Tandjong Selor (2° 30″ north) on the east coast. *A. t. damicra* and *zophonota* Oberholser are synonyms.

In north Borneo between Labuan and Sandakan a larger and much more yellowish race occurs, which has frequently been mistaken for *viridis*. A series of north Borneo birds agrees perfectly in size and coloration with a large series of males and females from Palawan and must be called *aequanimis* Bangs.

There is no difference between *viridis* of east and south Borneo, except that Pontianak birds are rather smaller than those from the rest of the range.

Chloropsis sonnerati zosterops Vigors

3 ♂ ad., 1 ♂ imm., 2 ♀, Riam; wing, ♂ ad., 96, 98, 98, ♀ 88, 89; tail, ♂ 70, 72, 72, ♀ 63, 63.

There is a considerable variation of size within the range of this race. The largest population occurs in north Borneo, from where Chasen and Kloss (1930) give the following measurements, wing, ♂ 98–106, ♀ 93–98; tail, ♂ 72–85, ♀ 67–77. Additional north Borneo birds measure: wing, ♂ 105, 106, ♀ 97; tail, ♂ 77, 78, ♀ 71. Birds from the Malay Peninsula are almost as large; wing, ♂ 99, 99, 103, 104, 104, 104, 105, 106, 106, 106; tail, ♂ 72, 74, 75, 76, 77, 78, 79, 80, 81. A male from Natuna measures, wing, 105; tail, 77.

Specimens from Sarawak, from east Borneo, and from Sumatra are somewhat smaller. Sarawak birds measure: ♂, wing 98, 100, 101, 102, 102, 103, 104, tail, 70, 72, 73, 74, 74, 75, 76. Sumatra birds: ♂, wing 96, 98, 99, 100, 102, 104, tail, 70, 71, 72, 75, 76.

Undoubtedly the smallest birds occur in south and south-east Borneo. In view of the irregular distribution of this size variation and in view of the considerable overlap, it seems advisable not to name the small south Borneo population.

Chloropsis cochinchinensis viridinucha (Sharpe)

1 ♀ Riam; wing, 79·5.

Chloropsis cyanopogon cyanopogon (Temminck)

1 ♂, Riam; wing, 85·5, tail, 65.

Irena puella criniger Sharpe

1 ♂ ad., Parit; 3 ♂ ad., Riam; wing, 114, 116, 120, 121; tail, 78, 80, 83, 83.

Ixos malaccensis (Blyth)

1 ♀ imm., Parit; wing, 99, tail, 83.

A very small specimen!

Euptilosus eutilotus (Jardine and Selby)

1 ♂ imm., Riam; wing, 86; tail, 72.

Brachypodius atriceps atriceps (Temminck)

1 ♀, Riam; wing, 76·5, tail, 63.

Microtarsus melanoleucus Eyton

2 ♂, 1 ♀, Riam; wing, ♂ 85, 86, ♀ 84; tail, ♂ 72, 73, ♀ 73.

Criniger g. gutturalis (Bonaparte)

1 ♂, Parit; 1 ♂, Riam; wing, 107, 115; tail, 84, 92.

The under tail-coverts are slightly deeper ochraceous in these two birds than in specimens from Sarawak and northern Borneo.—*Criniger ruficrissus* Sharpe is a good species, not a subspecies of *gutturalis*.

Criniger (Alophoixus) phæocephalus diardi (Finsch)

1 ♂ ad., Parit; 1 ♂, 1 ♀ Riam; wing, ♂ 96·5, 101, ♀ 90; tail, ♂ 77, 83, ♀ 71.

The Parit bird represents an interesting aberration. Instead of having the abdomen of the usual sulphur yellow of this species, it is of a rich egg yolk yellow. Enough specimens with sulphur yellow abdomens have been collected in south-east Borneo to indicate that this is only an individual variation, but it seems desirable to collect more specimens in the Sampit district.

The Parit bird shows slightly less yellow on the tail-tip than the two Riam birds. There is a gradual diminution in the width of the yellow tail-tip from south-west Borneo *(diardi)* toward north-east Borneo *(connectens)*, but it seems unnecessary to apply a special name (*medius* Kloss) to the intermediate populations, which occur both on the east and on the west coast.

Tricholestes criniger viridis Bonaparte

1 ♂, Parit; wing 75, tail 64

Trachycomus zeylanicus (Gmelin)

3 ♂, 1 ♀, Riam; wing, ♂ 117, 120, 122, ♀ 117; tail, ♂ 102, 107, 108, ♀ 106.

Pycnonotus goiaver gourdinii (Jacquinot and Pucheran)

3 ♂ ad., 1 ♂ juv., Parit; wing, 89, 90, 91; tail, 78, 79, 81.

Pycnonotus plumosus insularis Chasen and Kloss

1 ♂, 4 ♀, Parit; wing, ♂ 87, ♀ 81, 82; tail, ♂ 75, ♀ 70, 72, 72, 72.

Agrees in size with *insularis,* which is not a very strong race.

Pycnonotus simplex perplexus Chasen and Kloss

3 ♂, Parit; 1 ♂, 1 ♀, Riam; wing, ♂ 78, 80, 81, 86, ♀ 82; iris: ♂ brown, redbrown (2), light brown (Riam), ♀ light brown.

The irides of these specimens are according to their labels not red or crimson, as those of typical *perplexus*, but since the present series was not labelled by an ornithologist, there may be no actual difference.

Pycnonotus brunneus brunneus Blyth

1 ♂, 1 ♀, Parit; wing, ♂ 86, ♀ 79.

Pycnonotus erythrophthalmos salvadorii Sharpe

1 ♂ ad., Parit; 1 ♂ ad., 1 ♀ ad., Riam; wing, ♂ 73, 74, ♀ 72, tail, ♂ 64, 66, ♀ 63.

Birds from south Borneo are distinctly smaller than those of north Borneo reported by Chasen and Kloss (♂, wing 76–80, tail 68–78). Birds from east Borneo (Mahakkam and Berau Rivers) are intermediate. Twelve males have a wing of 73·5, 74, 74, 74, 75, 75, 76, 77·5, 80, 80, 80. All the measurements of 77 mm. and higher come from specimens collected north of the equator.

Pomatorhinus montanus bornensis Cabanis

1 ♂, Riam; wing 87·5.

Pellorneum capistratum capistratoides (Strickland)

1 ♀, Parit; wing 68.

Aethostoma rostratum macropterum (Salvadori)

2 ♀ ad., Parit; 1 ♀ ad., Riam; wing, 68, 70, 72, tail, 46, 46, 47·5.

Specimens in the Rothschild Collection from north Borneo as well as the Riam skin are pale and rather olive, and agree well with the characterization of this race given by Chasen and Kloss (1930, Bull. Raffl. Mus., 4, p. 75). Three east Borneo birds (Raven coll., U.S. Nat. Mus.) from Birang River, Segah River, and Labuan Klambu, also belong to this phase. The two Parit females, however, and to a lesser degree two birds in the U. S. Nat. Mus. (♂, Kendawangan River; ♂, Sungai Palawan) are much more rufous above, one of the birds even more so than most specimens from the Malay Peninsula. The distribution of the specimens in the rufous phase is quite irregular and I am unable to understand it.

Erythrocichla bicolor (Lesson)

1 ♂, Riam; wing 84, tail 61.

Malacopteron magnum magnum Eyton

2 ♂, 1 ♀, Parit; wing, ♂ 86, 88, ♀ 80; tail, ♂ 65, 73, ♀ 62.

Malacopteron cinereum cinereum Eyton

1 ♂, 1 ♀, Parit; 2 ♀, Riam; wing, ♂ 75, ♀ 71, 71, 73; tail, ♂ 60, ♀ 56, 56, 58.

Malacopteron affine affine Blyth

3 ♂ ad., 1 ♂ imm., 1 ♀, Parit; 2 ♂, Riam; wing, ♂ ad. 73, 75, 75, 76, 78, ♀ 70.

Stachyris nigricollis nigricollis (Temminck)

2 ♂ ad., 1 ♂ imm., Parit; wing, 72, 72.

Cyanoderma erythroptera rufa Chasen and Kloss

3 ♂ ad., 1 ♂ imm., 5 ♀, Parit; 1 ♀ imm., Riam; wing, ♂ 59, 59, 61, ♀ 54, 55, 56, 56, 58; tail, ♂ 45, 45, 46, ♀ 40, 41, 41, 43, 43.

This is a topotypical series of the very distinct south Borneo race.

Cyanoderma erythroptera apega Oberholser from Banka Island (type examined) is quite different from *rufa* (*see* Chasen and Kloss, 1932, Treubia, XIV, p. 16). Nape, back and scapulars are cinnamon brown, not bright rufous; forehead, sides of face and throat are of a paler gray; the size is about the same, ♂, wing 60, tail 45.5. It is altogether a less brightly colored bird than *rufa*.

Macronus ptilosus reclusus Hartert

1 ♂ imm., 1 ♀, Parit; 1 ♂ ad., 1 ♀, Riam. Wing, ♂ 71, 71, ♀ 68, 69; tail, ♂ 65, 70 (imm.), ♀ 62, 64.

At first glance these birds differ very conspicuously from a series of six specimens of *reclusus* (including the type) from north Borneo. They have upper and under parts more washed with olive, less rufous; the "tuft" and the upper tail-coverts are deeper and purer black. A series of twelve specimens from various parts of Borneo (excluding the south) shows, however, that this species is apparently very much subject to post-mortem changes. I believe that the rufous coloration and the brownish black of the tufts are largely due to foxing.

South Borneo birds are distinctly smaller than north Borneo specimens and tend toward *minor* Riley (Proc. Biol. Soc. Wash., vol. 50, p. 62). A series of north Borneo birds measures: wing, ♂ 75, 75, 75, ♀ 70, 70, 71; tail, ♂ 68, 68, 71, ♀ 63, 64, 65. East Borneo birds (Raven coll.) are somewhat intermediate;

wing, ♂ 70, 72, 72, 73, 74, ♀ 69, 72, 73; tail, ♂ 64, 65, 68, 71, ♀ 60, 62, 65. The measurements given by Chasen and Kloss (1930, p. 83) also average large.

Mixornis gularis bornensis Bonaparte

5 ♂, 4 ♀, Parit; wing, ♂ 62, 64, 64, 65, 66, ♀ 58, 61, 62, 62.

Specimens from parts of Sarawak and from north-west Borneo (Brunei) are much less rich chestnut brown on the upper parts than typical *bornensis* from the south. *M. g. montanus* Sharpe is not quite uniform, as Chasen and Kloss have already suspected (1930). Some specimens from Benkoker and the foot of Mt. Kina Balu are quite brownish above, similar to Brunei birds, but never as richly chestnut as south Borneo birds.

Copsychus saularis subspecies

Parit	21 June	♂ ad.	wing	106	tail	92	belly	black
,,	15 July	♂ ad.	,,	106	,,	93	,,	white
,,	9 July	♀ ad.	,,	98	,,	85		

The Sampit district belongs to the area where the intergradation between *pluto* and *problematicus* takes place.

The first of the Parit males is near *pluto*. The under tail-coverts are white and the lower belly mixed with white, but there is only very little white on the axillaries and the white on the secondaries is reduced; two thirds of the inner web of the third rectrix is black.

The other Parit male is of the *problematicus* type; the entire belly is white, there is a great deal of white on axillaries and under wing-coverts, the two secondaries next to the tertials are broadly edged with white, the black on the third rectrix is reduced and even the fourth has a white tip.

Copsychus saularis problematicus Sharpe

3 ♂ ad., 1 ♀, Riam; wing, ♂ 105, 107, 107, ♀ 99; tail, ♂ 94, 94, 96, ♀ 86.

Two of the males are typical *problematicus* with the belly all white and not much black on the third rectrix. The third male has the black extending considerably farther down the belly but shows no other tendency toward *pluto*.

Kittacincla malabarica suavis (Sclater)

3 ♂, 1 ♀, Parit; 2 ♂, Riam; wing, ♂ 95, 96, 98, 100, 101, ♀ 94; tail, ♂ 134, 137, 137, 140, 144, ♀ 109.

Orthotomus sericeus sericeus Temminck

1 ♂, 1 ♀ Parit (June); 1 ♂, Riam (Nov.); ♂ (June, tail, brown), wing 51, tail 46; ♂ (Nov., tail spotted black) wing 54, tail 40; ♀, wing 49, tail 40.

Orthotomus sepium borneoensis Salvadori

3 ♂ ad., 2 ♂ imm., 1 ♀, Parit; wing, ♂ 44, 47, 47, ♀ 43; tail, ♂ 37, 40, 42, ♀ 37.

Pityriasis gymnocephala (Temminck)

4 ♂ ad., 1 ♂ juv., 9 ♀, Parit; wing, ♂ ad. 146, 148, 149, 150, ♀ 145, 147, 148, 149, 150, 150, 152, 153, 154; tail, ♂ ad., 75, 76, 77, 78, ♀ 75, 75, 76, 78, 78, 78, 79, 79, 80.

The females seem to average slightly larger than the males. This species seems to be absent from some parts of Borneo.

Sitta frontalis corallipes Sharpe

1 ♂, Parit; 1 ♂, 1 ♀, Riam; wing, ♂ 73, 74, ♀ 71.

Dicæum cruentatum ? nigrimentum Salvadori

1 ♂, 1 ♀, Parit; wing, ♂ 47·5, ♀ 44.

It is with misgivings that I record these specimens as *nigrimentum*. The male has no black on chin or throat and is in fact not at all different from males of *ignitum*. Such males have already been recorded from other parts of Borneo (*see* 1933, Treubia, XIV, p. 163).

Dicæum trigonostigma dayakanum Chasen and Kloss

2 ♂, 3 ♀, Parit; 3 ♂, Riam; wing, ♂ 46, 46, 46, 47, 47, ♀ 43, 45, 45.

These birds are intermediate in the color of the throat between Malayan and North Borneo birds (*see* also 1932, Treubia, XIV, p. 17), but have the deep golden yellow rump of the Borneo race.

Dicæum chrysorrheum chrysorrheum (Temminck)

2 ♂ ad., 1 ♀, Parit; 2 ♂ ad., 1 ♂ juv., Riam; wing, ♂ 56, 57, 57, 58, ♀ 55.

Dicæum concolor borneanum Lönnberg

1 ♂, Parit; wing 44·5, tail 22.

Differs from *D. c. olivaceum* by being more creamy, less grayish below.

Anaimos percussus ignicapillus (Eyton)

4 ♂ ad., 2 ♀, Parit; wing, ♂ 53, 55, 55, 56, ♀ 50, 51·5.

Another Borneo record of this rare species. Compared with a series from the Malay Peninsula, these Borneo birds have the spot on the breast on the average larger, there is more white on the chin and the red patch on the crown is more deeply colored (? not yet faded). These differences seem insignificant.

Anaimos maculatus (Temminck)

The geographical variation of this species was, until recently, very insufficiently understood. The extremes, the gray *septentrionalis* (Peninsular Siam), and the very yellow *natunensis* are quite different, but they are connected by a series of intermediate populations, one of which is still unnamed. The characters of these races are as follows:

Anaimos maculatus septentrionalis Robinson and Kloss

Similar to *Anaimos maculatus* subsp. (southern Malay Peninsula), but grayer; upper parts less olive, gray zone on forehead more extensive; ear-coverts and malar stripe much more grayish; streaks on sides of breast and flanks still more grayish; white streak on upper throat narrow. Seven specimens from Peninsular Siam examined.

Anaimos maculatus oblitus, new subsp.

Type.—No. 450,994, Amer. Mus. Nat. Hist. (Rothschild Collection); ♂ ad.; Semangko Pass, Selangor—Pahang border, 2,500–4,500 feet; February 19, 1908, Selangor Mus. Collection.

Similar to *A. m. maculatus*, but slightly larger, tail of adult males 26–28, against 24–26; upper throat white or whitish, not yellow; forehead gray; upper parts darker and less citrine, particularly crown and upper tail-coverts; ear-coverts, malar stripe and streaks on sides of breast and flanks greenish or grayish green, not olive. Fourteen specimens from Perak, Pahang, Selangor and Johore examined.

Anaimos maculatus maculatus (Temminck)

2 ♀ (? = ♂ ad.), Parit; wing 51, 52, tail 23, 25.

Upper parts rather citrine, forehead olive; subauricular stripe and middle of throat yellowish; under parts rather deep yellow; streaks on sides of breast and flanks olive and rather less conspicuous than in the other races. Size, wing 50–54 (52·0), tail 23–25, once 26. Thirteen specimens from Borneo examined.

Chasen and Kloss (Bull. Raffl. Mus., No. 4 (1930), p. 111) give rather larger measurements (wing 50–56, tail 27–28) for north Borneo birds than I have found for south and east Borneo specimens. South Borneo is the type-locality of this species.

A single specimen from Sumatra (Upper Siak River, Dr. W. L. Abbott) agrees perfectly with the Bornean specimen, and not, as one might expect, with *oblitus*. Oberholser has described a race *opistatus* from Nias, as being smaller than *maculatus*. A single male from Nias in the Rothschild Collection agrees well in coloration with south Borneo birds, except for a rather white throat, its measurements, wing 52, tail 23, do not fall below the range of *maculatus*.

Anaimos maculatus natunensis (Chasen)

Exceedingly close to *A. m. maculatus* of south Borneo, but of a slightly richer yellow underneath. Two males examined.

When Chasen described this race, he compared it unfortunately with a series of *oblitus* from the Malay Peninsula, and the characters he gives in his original description are those which separate *maculatus* from *oblitus*. There are one or two of the Borneo birds which are exactly like the Natuna specimens, but as a series the Borneo birds average paler yellow underneath.

Aethopyga siparaja siparaja Raffles

6 ♂ ad., 1 ♂ imm., Parit; ♂ ad., wing 48, 48, 48, 48, 49, 50; tail 35, 35, 37 38, 40, 43.

These birds are very small, but agree in coloration with north Borneo birds.

Cinnyris brasiliana brasiliana (Gmelin)

4 ♂ ad., Riam; wing, 45·5, 46, 46·5, 47.

Anthreptes hypogrammica hypogrammica S. Müller

1 ♀, Parit; wing 62.

The name *macularia* Blyth is a nomen nudum and *hypogrammica* seems to have a few months priority over *nuchalis* Blyth (published not before December, 1843).

Anthreptes malacensis malacensis (Scopoli)

1 ♂ ad., 1 ♀ ad., Parit; 1 ♂ ad., 1 ♂ imm., Riam; wing, ♂ 61, 62, 63, ♀ 59; tail, ♂ 40, 40, 41, ♀ 38.

These specimens have the auricular region pure olive, the scapulars prevailing olive, and are smaller than even typical *malacensis*. This species has been oversplit and I refrain from giving a name to this slightly differentiated south Borneo population.

Anthreptes rhodolaema rhodolæma Shelley

3 ♂ ad., 1 ♀, Riam; wing, ♂ 67, 67, 69, ♀ 61.

Chalcoparia singalensis singalensis (Gmelin)

1 ♂ ad., 1 ♂ imm., 1 ♂ juv., 1 ♀ ad., Parit; wing, ♂ 54·5, ♀ 51·5.

I can find no difference whatsoever between a considerable series of birds from all parts of Borneo and a large series from the Malay Peninsula. The rufous of the throat of our Borneo specimens is definitely not darker than that of Malay Peninsula birds.

Arachnothera longirostra büttikoferi van Oort

5 ♂, 3 ♀, Parit; wing, ♂ 63, 65, 66, 66, 66·5, ♀ 58, 59, 60.

These specimens from south Borneo must be considered typical *büttikoferi*. They are not quite as bright as specimens from Sarawak (Mt. Dulit and Penrisen Mts.). The pectoral tufts are only very vaguely indicated in the entire series and if they are present at all, they are pale, not vividly colored as in north Borneo specimens. Malay Peninsula birds are still paler and duller, and seem to have the gray extended to the lower throat.

Arachnothera chrysogenys chrysogenys (Temminck)

1 ♂, Riam; wing 85.

Arachnothera crassirostris (Reichenbach)

1 ♂ ad., Riam; wing, 75; bill (from lateral feathering), 29.

This bird differed from two specimens from the Malay Peninsula by its short bill and the paleness of the pectoral tufts. Dr. H. Friedmann kindly sent me the material of the U. S. Nat. Mus., and I have altogether examined the following adult males: four from Borneo, two from the Malay Peninsula, and four from Trong, lower Siam. The bill of the Borneo birds measures 29, 30, 31, 32, Malay Peninsula (Gunong, Tahan) 32, 33, Siam 30, 31, 32, 32; the wing: Borneo 73, 75, 76, 77, Malay Peninsula 75, 77, Siam 75, 76, 79, 79. These measurements show that the differences of size are very small. The pectoral tuft of two of the four Borneo birds is as deep orange as in birds from other localities, and the only slight difference which I can discover between the Borneo birds and those of Siam is that the latter have the edges of the upper wing-coverts, the wing-feathers, and the upper tail-coverts more golden yellow, less greenish. Even this difference is partly bridged by individual variation and the two Malay Peninsula birds are intermediate. From Sumatra (type-locality) only an immature bird was examined. The females also show no difference.

Lonchura atricapilla minuta (Meyen)

2 ♂ ad., Parit; wing 51, 53.

The two birds are darker on the back than even the darkest specimen of a series of nine birds from north Borneo and the Natuna Islands.

Lonchura leucogastra castanonota, new subspecies

Type.—No. 446,825, Amer. Mus. Nat. Hist.; ♂ ad.; Riam (Kotawaringin), south Borneo; November 14, 1935; J. J. Menden. 1 ♂ ad., 1 ♂ juv., 1 ♀ ad., Parit; 2 ♂ ad., 1 ♀ ad., Riam.

Similar to *L. l. leucogastra* Blyth, but upper parts rich rufous chestnut, not dull earth brown; forehead, crown and sides of head blackish; throat, flanks and rump jet black, not brownish black; back, scapulars, tertials, and upper wing-coverts with well-defined white shaft-streaks; altogether more richly colored than twelve specimens of *leucogastra* from Sumatra, Malay Peninsula, Siam and Tenasserim.

Wing, ♂ ad. 50, 51, 51, ♀ 50, 50; tail, ♂ ad. 34, 35, 35, ♀ 35, 36.

The species was hitherto unknown from south Borneo. A single female from the Tutong River, Brunei, north Borneo, has the throat very brownish and is distinctly nearer to *everetti* than to *leucogastra*. It has nothing to do with *castanonota*. The differences of *castanonota* are equally well shown in the worn Parit, as in the fresh Riam specimens.

Lonchura fuscans (Cassin)

3 ♂ ad., 1 ♂ juv., 2 ♀ ad., 3 ♀ imm., Parit; 1 ♂ juv., 1 ♀ ad., Riam; wing, ♂ ad. 49, 50, 52, ♀ ad. 49, 50 50.

Gracula religiosa religiosa (L.)

1 ♂, 1 ♀, Parit; wing, ♂ 184.

Oriolus xanthonotus xanthonotus Horsfield

1 ♂ ad., Parit; wing 107, tail 68.

Dissemurus paradiseus brachyphorus (Bonaparte)

3 ♂ ad., 1 ♂ imm., 1 ♀, Parit; 3 ♂ ad., 3 ♀ ad., 1 ♀ juv., Riam; wing, ♂ ad. 138, 140, 140, 142, 145, 147, ♀ ad. 133, 137, 137; central tail-feather, ♂ ad. 111, 114, 115, 117, 117, 124, ♀ ad. 110, 112, 112, 114; longest tail-feather, ♂ ad. 258, 266, 280, 302, 310, 312.

This is one of the few cases where the south Borneo population tends to larger measurements than the north Borneo birds.

Corvus enca compilator Richmond

1 ♂, 2 ♀, Riam; wing, ♂ 320, ♀ 288, 311; tail, ♂ 162, ♀ 152, 160.

Platysmurus leucopterus aterrimus (Temminck)

2 ♂ ad., 3 ♂ imm., 1 ♀ ad., 1 ♀ imm., Parit; 2 ♂ ad., Riam; wing, ♂ ad. 188, 190, 191, 194, ♂ imm., 170, 171, 178, ♀ ad. 182; tail, ♂ ad. 167, 168, 170, 172, ♂ imm. 152, 155, 162, ♀ 170.